

IN THE CLAIMS

Please amend the claims as follows:

Claim 1 (Currently Amended): An apparatus for detecting a different kind of object among objects using a plane spectrometer, comprising

a conveyer means for conveying a plurality of objects;

an irradiating means for irradiating near-infrared rays to the plurality of objects conveyed by ~~means of~~ the conveyer means;

a plane spectrometer performing plane spectroscopy for a reflected light of [[the]] near-infrared rays reflected from the plurality of objects, to which the near-infrared rays are irradiated with the irradiating means;

an imaging means for converting a plane spectrogram of the reflected light produced through the plane spectrometer into an electric signal by means of a near-infrared ray camera;
and

an analyzing means for detecting a different kind of object from the plurality of objects using a method of main component analysis upon obtaining spectral data of the reflected light by means of analyzing the electric signal obtained with the imaging means,
[[.]]

wherein the analyzing means is configured to perform
a wavelength axis averaging processing for averaging spectral data in a direction of
the wavelength axis;
an interpolation processing for interpolating the spectral data using Lagrangian
secondary interpolation;

a measuring position optimization processing for detecting a center position of the object by detecting an edge of the object upon accumulating the spectral data in a direction of a spatial axis;

a spatial axis averaging processing for obtaining an average value of each wavelength at a plurality of points in a vicinity of the center position of the object detected by the measuring position optimization processing;

a differentiation processing for performing a first differentiation or a second differentiation for the spectral data;

a main component score calculation processing for calculating the main component score by calculating previously obtained loading vector data and the spectral data obtained from the above-listed processes; and

a determination processing for determining whether to be a different kind of object or a same kind of object on a basis of the calculated main component score.

Claim 2 (Canceled).

Claim 3 (Currently Amended): [[An]] The apparatus according to Claim [[2]] 1, wherein the wavelength axis averaging processing of the analyzing means performs at least any of

a preprocessing for averaging the spectral data;
a preprocessing for standardizing the spectral data on [[the]] a basis of a ratio of the spectral data to a predetermined value;

a preprocessing for standardizing the spectral data on [[the]] a basis of a difference between the spectral data and a predetermined data; or
the wavelength axis averaging processing for forming a moving average of the spectral data in the direction of the wavelength axis.

Claim 4 (Currently Amended): [[An]] The apparatus according to any one of Claims Claim 1 through 3, wherein the analyzing means is configured to perform a conversion processing for smoothing the spectral data.

Claim 5 (Currently Amended): [[An]] The apparatus according to any one of Claims Claim 1 through 4, wherein the analyzing means is configured to perform a correction processing for the spectral data by means of a MSC (Multiplicative scatter correction) method.

Claim 6 (Currently Amended): [[An]] The apparatus according to any one of Claims Claim 1 through 5, wherein the analyzing means is configured to detect abnormality of the object in a case that [[the]] an edge exceeding a predetermined threshold cannot be detected in the measuring position optimization processing for detecting the center position of the object by means of detecting the edge of the object upon accumulating the spectral data in the direction of the spatial axis.

Claim 7 (Currently Amended): [[An]] The apparatus according to any one of Claims
Claim 1 through 6, wherein the analyzing means is configured to perform the main component analysis for the object at each of the lines line being conveyed in multiple lines, using the loading vector data created at each line of the lines.

Claim 8 (Currently Amended): [[An]] The apparatus according to any one of Claims
Claim 1 through 7, wherein the analyzing means is configured to perform the main component analysis selecting only data of a predetermined wavelength band in the spectral data.

Claim 9 (Currently Amended): [[An]] The apparatus according to any one of Claims
Claim 1 through 8, wherein the analyzing means is configured to perform a conditional branching processing while repeating for two or more times upon changing a condition of the main component analysis.

Claim 10 (Currently Amended): [[An]] The apparatus according to any one of Claims
Claim 1 through 9, wherein the imaging means is a rolling-type near-infrared ray camera, the rolling-type near-infrared ray camera having a camera rotating mechanism whereby the rolling-type near-infrared ray camera can be rotated around a shaft in parallel with a light axis thereof.

Claim 11 (Currently Amended): [[An]] The apparatus according to any one of Claims
Claim 1 through 10, wherein the conveying means comprises a sheet-like conveying device
for conveying [[the]] objects, the sheet-like conveying device having a flap-inhibitor for
preventing flap of the object by means of pressing a peripheral portion of the sheet-like
conveying device around the object to be conveyed.

Claim 12 (Currently Amended): [[An]] The apparatus according to any one of Claims
Claim 1 through 11, wherein a light volume compensator having a predetermined reflectance
property is disposed at a position within a visual field of the imaging means.